The Design and Implementation of Computerized Questionnaires for Mammography and GI patients in a Large Multi-Specialty Practice

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Application of high performance computing in health care has begun to unfold. Computers and related equipment are increasingly being used in data information flow, patient management, program development and maintenance, and more recently in outcomes research.

We are all familiar with computer-scored answer sheets used in national standardized tests. Application of this technology is just now being applied in health care settings. The process of entering raw data obtained from questionnaires into datasets useable for analysis can be tedious, time consuming, frustrating, and if not carefully monitored, fraught with errors. Optically scanned questionnaires, on the other hand, provide a quick and accurate way to enter patient questionnaire data.

Scannable questionnaires require the development of a specific response format. Answers must fit into categories. Open-ended questions are to be avoided as they cannot be scanned. Data from scanned questionnaires is stored in an ascii format data file. This data can be read into a variety of software formats from databases to spreadsheets to graphics.

We describe our experience in the design and implementation of two optically scanned questionnaires that are completed by a)all women undergoing mammography in the radiology department of a large multi-specialty clinic (15,000 per year). and b)all patients undergoing any gastrointestinal endoscopic examination (3500/year). The mammogram questionnaire has an area for the radiologist to fill in examination findings. Similarly, the GI questionnaire captures extensive examination findings through the physician recording the results of the examination on the questionnaire.

The design phase of our questionnaires included several pilot tests to determine the design format that would provide the most straight forward completion by the patient as well as the physician, thereby ensuring the most accurate and reliable collection of data. Subsets were then scanned to see if in fact the format was such that patients and physicians understood how to complete the form and that doing so was relatively effortless, thereby giving us complete and accurate data. This step also provided us with information about the reliability of the scanner itself. Personnel in the radiology and the GI departments were indoctrinated in the process as they were the ones to whom the patients would be most likely to turn to for assistance in completing the questionnaire.

Information collected on mammogram patients includes patient demographics, personal risk factors for breast cancer including family history, parity. and menopause and estrogen use. Other questions address current problem areas. The radiologist uses this information to aid in the interpretation of the films. All radiological findings are also recorded.

Information collected on GI patients includes demographics and risk factors for GI diseases and cancers as well as any presenting symptoms. Physician data includes examination findings in great detail.

The data collected allows us to 1)provide an accurate description of the population receiving mammography and GI endoscopic examinations and identify any trends within these groups; 2)design and implement surveillance systems for high risk individuals; and 3)identify individuals who may be appropriate for specific research protocols in which we are participating.

We believe our experience can provide direction for other institutions undertaking similar computerization activities. We will share aggregate data from both our mammography and GI databases.